# Periscope.

## a.—ANATOMY OF THE NERVOUS SYSTEM.

Anatomy of the Cerebral Convolutions.—Prof. Eberstaller, of Gratz, (*Wien. med. Blätter*, 1884,) believes that the present classification of the cerebral convolutions takes too little account of the great variations presented. In a scheme of the brain surface it is necessary to include not only the sulci which are usually present, but also the variations frequently found. Believing in Gratiolet's maxim, that hastily drawn conclusions are dangerous to science, E. bases his conclusions on the observation of fifty male and fifty female adult brains, and further verifies them by examination of fifty adult and fœtal brains, and the brain of an orang-outang.

The author lays much stress on the deep convolutions. As they can only be seen when the convolutions are sufficiently separated, a complete removal of the pia mater is necessary for their proper examination. They indicate that one sulcus is composed of several partial sulci, or that neighboring sulci have become irregularly united. The knowledge of the localities where deep convolutions are usually found gives us a key to the understanding of the variations occurring within physiological limits.

The author divides the interparietal sulcus into three typical parts, an anterior transverse, a posterior transverse, and a sagittal portion. The posterior transverse is the analogue of the ape fissure; it is the fissura perpendicularis externa of the primate brain, and therefore the, always present, anterior boundary of the occipital lobe. The prolongation of the parieto-occipital sulcus far outwardly is a peculiarity of the anthropoid brain, and therefore in man a mark of lower development. On the other side, the increased size of the inferior parietal convolution is a mark of high development.

The occipital lobe also possesses a constant boundary line inferiorly, the sulcus occipitalis lateralis. The parts below this sulcus belong to the temporal lobe. Between this sulcus and the ape fissure is the second bridging convolution of Gratiolet.

In one fifth of all instances the ape fissure divides this bridge, presses it down into a deep convolution, and terminates super-

ficially in the sulcus occipitalis lateralis. The thus lessened occipital lobe has few constant sulci. On this account its division into convolutions is difficult. Author finds here traces of three sulci.

The central sulcus, like the interparietal, has several parts—a median, lateral, and transverse. The horizontal part of the Sylvian fissure has not only an ascending but also a descending branch.

The author distinguishes three parietal arching convolutions: the anterior parietal (gyrus supermarginalis), central parietal (gyrus angularis), and posterior parietal, first found in the orang-outang, where it plays a small rôle, which contains the sulcus occipitalis anterior of Wernicke.

So the brain of man is distinguished from the anthropoid brain by the largely developed inferior parietal convolutions, as well as by the large size of third frontal lobe. These differences are brought by the author in relation with the power of speech.—*Schmidt's Jahrbücher*, 1884, No. 5.

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New Researches into the Structure of the Brain.—In a communication to the Academy of Sciences, July 7, 1884, (*Gazette Hebdomadaire*, July 11, 1884,) M. Luys gave the results of his examination of the brain, hardened after a new method. The brain is placed successively in solutions of bichromate of potash, carbolic acid, and methyl alcohol, and, on account of the consistency thus acquired, the various systems of white fibres can be distinctly isolated. L. thus succeeded in dividing the fibres in the centre of the brain into three systems.

1st.—The system of commissural fibres. These unite the symmetrical parts of the two hemispheres to one another; also unite the various parts of each hemisphere.

2d.—The second system L. terms cortico-thalmique. It consists of radiating fibres which bind the various territories to the optic thalamus. All these fibres converge toward the optic thalamus, the posterior being directed from behind forward, the superior from above downward, and the anterior, from a corresponding part of the cortex, from before backward. In order to reach their centre of convergence, the latter pass directly through the gray matter of the corpus striatum, dividing it into two segments. These are the fibres improperly termed internal capsule. The fibres of this system, soon after reaching their centre of convergence, are lost either in the gray matter of the thalamus or in the central gray matter of the third ventricle.

3d.—The third system, the cortico-striata fibres, as yet insufficiently described, consists of a series of fibres, having a common origin with the preceding in the different regions of the cortex, which enter into relation with the gray matter of the corpora striata, or the sub-thalmique ganglia.

These fibres have also a converging direction, and, where they closely embrace the outer side of the corpus striatum, are termed

external capsule. Their termination in the central regions is a matter of much interest. While a part of them is lost in the gray matter of the corpus striatum, others enter into the deeper ganglia from the red nucleus of Stilling to the nuclei of the olivary body. Hence it follows that the cortex is directly united, not only with corpus striatum and optic thalamus, but also with the whole series of small gray nuclei in the pons and medulla.

As to their physiological relationship, it may be said that : (1) the transverse or communicating fibres serve for the harmonious action of the homologous parts of the hemispheres ; (2) the cortico-thalmique transmit in a centrifugal direction sensorial impressions from the optic thalami to the cortex ; (3) the cortico-striata fibres transmit excitations from the cortex in the psycho-motor territory to the corpora striata ; (4) as to the fourth system of fibres—the cortico-sub-thalmique—its physiological rôle is as little known as that of the ganglia in which this system of fibres terminates.

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THE CORPUS CALLOSUM.—Hamilton (*Edinburgh Clinical and Pathological Journal*, June 7, 1884) has given us some new views of the anatomical relations of the corpus callosum. The view generally accepted, that it contains commissural fibres connecting symmetrical part, of the two hemispheres, is almost altogether rejected by him.

His method of examination is as follows : Brain is hardened and then cut into perpendicular sections one half inch in thickness. These sections are frozen and the surfaces polished. He states that the course of the fibres is then marked out with almost the same clearness as the grain of a piece of polished mahogany.

H. states that the fibres of the corpus callosum, after they have arrived in the opposite side of the brain, pass downward, some into the internal capsule to become united chiefly with the optic thalamus, in small part with the head of the caudate nucleus, and perhaps in part with the pons and medulla ; others into the external capsule which pass later into the optic thalami, olfactory tracts, optic tracts, and temporal lobes.

These views, so contrary to what has been usually taught, and to what physiological considerations appear to demand, are not likely to obtain much credence.

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STRETCHING OF THE SPINAL CORD.—Hegar (*Volkmann's Sammlung klin. Vorträge*, No. 239) made a number of careful observations on the cadaver to determine the effects of extension of the vertebral column etc., upon the cord and its membranes. He removed the posterior vertebral arch, and after studying the effects of extension upon the membranes, opened the latter for a more careful observation of the cord.

The following is a summary of his results. On forcibly flexing the spine anteriorly the membranes become flattened, and both

cord and membranes are stretched. Probably cord and membranes are equally affected. The prolongations of the dura mater afford the means of extension and counter-extension. The nerves and the brain are but little affected by the flexing of the spine. On the other hand, a considerable stretching of the nerves will produce a degree of tension in the cord even when the spine is in its usual position. The effect of such nerve-stretching is variable. But if the cord be already put on the stretch, through flexing of the vertebral column, then stretching the previously exposed sciatics, or even the bloodless stretching of the latter, produces a much greater effect on the cord. In this case the effect of the nerve stretching reaches, though to a lessened degree, to the highest part of the cord, and perhaps also to the brain.

The author believes it would be well to test the value of stretching of the cord as a therapeutic measure in disease. He thinks it would at least be justifiable to try it in those cases where nerve-stretching has hitherto been tried. The object of such treatment would be to set up a curative action through changes in the nutrition, circulation, or function of a part.

The manner of operating suggested is as follows. The force may be applied especially to the upper or lower part of the spine, according as we wish to cause a greater stretching of the upper or lower part of the cord.

In the first instance, the patient being seated on the table with the knees extended, the head and breast will be forcibly flexed toward the lower extremities. To this forcible extension of the spine may now be added the bloodless stretching of the sciatic nerves, through flexing the legs strongly at the hip-joints, the knees being still held in an extended position.

In the second instance, the force is applied directly to the lower part of the spine. The patient lies flat on the back. The knees being extended, the legs will be lifted toward the breast until the hip-joints are strongly flexed.

It may be necessary to practise these procedures some time before succeeding in producing sufficient extension to be of practical consequence. Very great extension is probably not without danger.

PHILIP ZENNER, M.D.

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## *b.*—PHYSIOLOGY OF THE NERVOUS SYSTEM.

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THE FUNCTIONS OF THE CEREBELLUM.—Prof. Luciani has made a series of experiments upon this subject. The animals used were dogs. He kept alive a dog for eight months in which he had almost completely removed the cerebellum.

At the post-mortem the flocculi, the truncated peduncles, and the degenerated remains of the inferior vermiform process were the only portions to be seen. There were three periods in the phenomena presented by this animal. Immediately after the operation there was inco-ordination of all the voluntary move-